

Wisconsin: Manitowoc, 9½; Franklin, 5½; Ripon, 4½; Madison, 3½; Milwaukee, about 3.

DEPTH OF UNMELTED SNOW ON GROUND AT END OF THE MONTH.

[Expressed in inches.]

Connecticut: Southington, 10; New London, 7½; New Haven, 6.

Dakota: Fort Stevenson, 1; Fort Buford, 1; Fort Bennett, trace; Bismarck, trace; Wicklow, trace.

District of Columbia: West Washington, 2; Washington, ½.

Illinois: Polo, 2; Springfield, 2; Charleston, 1; Champaign, 1½; Morrison, ½; Cairo, trace; Chicago, trace.

Indiana: Wabash, 5; Logansport, 3; La Fayette, 2.

Iowa: Keokuk, 1½; Cedar Rapids, trace; Davenport, trace; Guttenburg, trace.

Maine: Cornish, 6; Gardiner, 4½; Eastport, 4½; Portland, 4.

Maryland: Cumberland, 2; Fallston, 2; Sandy Springs, 2; Emmitsburg, ½; Baltimore, trace.

Massachusetts: Fall River, 6; Somerset, 6; Westborough, 5; Springfield, 4½; Boston, 4; Charleston, 4; Fort Warren, 4; Milton, 3; Williamstown, 3; Worcester, 2; Dudley, 1; Amherst, ½.

Michigan: Marquette, 4; Northport, 3½; Alpena, 2; Litchfield, 2; Mackinac City, 2; Thornville, 2; Escanaba, 1½; Lansing, 1; Port Huron, 1; Grand Haven, ½; Detroit, trace.

Minnesota: Minneapolis, 4; Moorhead, 3; Northfield, 3; Saint Paul, 2½; Duluth, 1½; Saint Vincent, 1.

Missouri: Saint Louis, 2½.

Montana: Fort Keogh, 1.

New Hampshire: Grafton, 6½; Mount Washington, 6; New Market, 5; Auburn, 4.

New Jersey: South Orange, 7; Paterson, 6; Freehold, 5; Moorestown, 3; Vineland, 3; Sandy Hook, ½; Atlantic City, trace.

New Mexico: Santa Fé, trace to 4.

New York: Ardenia, 12; White Plains, 12; Flushing, 11; Factoryville, 10; Nile, 10; Rochester, 9; Port Jervis, 8; Ithaca, 6; Cooperstown, 6; North Volney, 5½; New York City, 5; Oswego, 5; Buffalo, 4; Johnstown, 4; Albany, 3; Hector, 3; Penn Yan, 3; Palermo, 1½.

Ohio: Ruggles, 5; New Riegel, 4½; Cleveland, 4; Toledo, 3; Marion, 2; New Athens, 2; Westerville, 2; Columbus, 1; North Lewisburg, 1; Sandusky, 1; Bethel, ½; College Hill, trace.

Pennsylvania: Grampian Hills, 6½; Dyberry, 5; Fallsington, 4; Erie, 5; West Chester, 3½; Catawissa, 3; Williamsport, 3; Wellsboro, 2½; Philadelphia, 2; Pittsburg, ½.

Rhode Island: Block Island, 1; Newport, trace.

Tennessee: Nashville, ½; Chattanooga, trace.

Vermont: Woodstock, 3; Burlington, 1.

Virginia: Lynchburg, 1½; Accotink, 1.

West Virginia: Morgantown, 1½.

Wisconsin: Ripon, 3; Franklin, 2; Beloit, ½; Madison, ½; La Crosse, trace; Milwaukee, trace.

Wyoming: Fort Washakie, 2½.

SNOW FROM A CLOUDLESS SKY.

College Hill, Ohio, 29th: During the evening, for several hours, a fine sprinkling snow fell, when the stars were visible and all parts of the heavens were perfectly clear.

SLEET.

Newport, Rhode Island, 29th.

Lynchburg, Virginia, 26th.

Washington, District of Columbia, 13th.

Barnegat, New Jersey, 29th.

Augusta, Georgia, 21st.

Charlotte, North Carolina, 20th, 27th.

Cape Lookout, North Carolina, 21st.

Little Rock, Arkansas, 24th.

Memphis, Tennessee, 19th.

Chattanooga, Tennessee, 20th.

Champaign, Illinois, 25th.

Cincinnati, Ohio, 26th.

Pittsburg, Pennsylvania, 23d.

Detroit, Michigan, 23d.

Toledo, Ohio, 13th.

Cleveland, Ohio, 26th.

Buffalo, New York, 13th, 19th, 24th.

Duluth, Minnesota, 11th.

Alpena, Michigan, 22d.

Mackinac City, Michigan, 12th.

Moorhead, Minnesota, 6th, 15th.

Springfield, Illinois, 25th.

Dubuque, Iowa, 23d.

Keokuk, Iowa, 25th.

Leavenworth, Kansas, 16th, 17th.

Springfield, Missouri, 25th.

Cheyenne, Wyoming, 15th.

Fort Maginnis, Montana, 26th.

Coleman City, Texas, 18th, 19th.

Fort Davis, Texas, 18th.

Fort Verde, Arizona, 10th.

Umatilla, Oregon, 17th.

Auburn, Alabama, 25th.

Alexandria, Dakota, 11th.

Vevay, Indiana, 12th.

Rowe, Massachusetts, 13th.

Wellsborough, Pennsylvania, 25th.

Stateburg, South Carolina, 20th.

Aiken, South Carolina, 21st.

Snowville, Virginia, 28th.

Variety Mills, Virginia, 26th.

WINDS.

The prevailing direction of the winds during the month of November, 1882, at Signal Service stations, are shown on chart ii., by arrows flying with the wind. The prevailing winds along the Atlantic coast, from New England to Florida, are from northwest to northeast; in the upper lake region, the extreme northwest, and the upper Mississippi and Missouri valleys, they are generally northwesterly; in the Gulf states most are from the south; elsewhere throughout the country, they are variable.

TOTAL MOVEMENTS OF THE AIR.

[In miles.]

The following are the largest total movements at the Signal Service stations: On the summit of Mount Washington, New Hampshire, 21,708; Pike's Peak, Colorado, 15,302; Delaware Breakwater, Delaware, 13,583; Block Island, Rhode Island, 13,220; Kittyhawk, North Carolina, 12,991; Hatteras, North Carolina, 12,406; Cape May, New Jersey, 12,263; Sandy Hook, New Jersey, 10,944; Barragat, New Jersey, 10,635; Cape Henry, Virginia, 10,498; Indianola, Texas, 10,078; Port Eads, Louisiana, 10,062; Sandusky, Ohio, 9,836; Chincoteague, Virginia, 9,715; Fort Macon, North Carolina, 9,694; Eastport, Maine, 9,238; Key West, Florida, 8,976; Mackinac City, Michigan, 8,415; Fort Shaw, Montana, 8,098; Provincetown, Massachusetts, 8,087; Milwaukee, Wisconsin, 8,058. The smallest are: Visalia, California, 1,530; Roseburg, Oregon, 1,568; Fort Missoula, Montana, 1,885; Lynchburg, Virginia, 2,111; Lewiston, Idaho, 2,177; Olympia, Washington Territory, 2,289; Deadwood, Dakota, 2,301; Tucson, Arizona, 2,461; Boise City, Idaho, 2,601; Salt Lake City, Utah, 2,613; Spokane Falls, Washington Territory, 2,660; Fort Washakie, Wyoming, 2,753; El Paso, Texas, 2,873; Keokuk, Iowa, 2,898.

HIGH WINDS.

On the summit of Mount Washington, New Hampshire, velocities of 50 miles or more per hour occurred on all days during the month, with the exception of the following dates: 4th to 10th, 17th, 18th, 22d, 29th. The following were the highest velocities reported from this station: 87, nw., 1st; 76, nw., 11th; 81, sw., 13th; 88, nw., 20th; 98, nw., 25th (maximum for month); 88, nw., 26th.

On the summit of Pike's Peak, Colorado, the highest velocities were: 72, w., 2d; 62, sw., 3d; 72, sw., 4th; 59, sw., 5th;

50, s., 10th; 64, w., 21st; 68, w., 22d; 52, sw., 26th; 80, nw., 27th.

Other stations reporting velocities of 50 miles or more per hour are as follows: Cape Mendocino, California, 85, (estimated) se., 20th; Fort Maginnis, Montana, 62, nw., 4th; Sandusky, Ohio, 58, n., 29th; Cape Henry, Virginia, 56, nw., 29th; Buffalo, New York, 56, w., 24th; Cape May, New Jersey, 55, w. 24th; Grand Haven, Michigan, 52, nw., 23d; Indianola, Texas, 52, n. 13th; Kittyhawk, North Carolina, 50, ne., 5th.

LOCAL STORMS.

California: Cape Mendocino, 20th, a severe southeasterly gale began at 12.30 a. m., and lasted until 6.00 p. m. The wind reached a velocity of seventy-two miles an hour at 10.00 a. m., at which time the anemometer cups were blown away. It is estimated that the wind reached a velocity of eighty five miles an hour when the gale was at its height. A strong southeasterly gale was also reported on the 28th. During the 29th and 30th, a violent storm occurred; the wind blew in hurricane-like gusts, causing the office building to rattle and shake.

Connecticut: New Haven, 13th, during a severe gale that occurred in Long Island Sound, two barges and a schooner foundered; the latter vessel had all her sails blown away.

New London, 14th, a heavy gale occurred in Long Island Sound; several vessels sought shelter inside the harbor. On the 25th, during a gale, numerous vessels lost sails and sustained other damage.

Illinois: Cairo, 9th, a strong wind, accompanied by hail, (see Hailstorms), occurred about 11.30 p. m. One house was unroofed; other damage was very slight.

Iowa: 10th, during a wind storm that occurred at Rippey, Greene county, a house was blown down and completely demolished. The inmates were more or less injured.

Pennsylvania: Wellsboro, 25th, a heavy wind storm occurred at 12.30 p. m. Trees and fences were blown down, but no serious damage was done. The storm was accompanied by sleet and hail.

VERIFICATIONS.

INDICATIONS.

The detailed comparison of the tri-daily indications for November, 1882, with the telegraphic reports for the succeeding twenty-four hours, shows the general average percentage of verifications to be 88.74 per cent. The percentages for the four elements are: Weather, 87.05; direction of the wind, 89.39; temperature, 90.34; barometer, 88.18 per cent. By geographical districts, they are: For New England, 87.2; middle Atlantic states, 88.8; south Atlantic states, 92.2; east Gulf states, 89.8; west Gulf states, 87.2; lower lake region, 89.8; upper lake region, 87.3; Tennessee and the Ohio valley, 90.1; upper Mississippi valley, 88.6; Missouri valley, 86.5; north Pacific coast region, 89.1; middle Pacific coast region, 85.0; south Pacific coast region, 83.9.

There were one hundred and six omissions to predict (forty-five being due to the absence of reports from the Pacific coast), out of 3,690, or 2.87 per cent. Of the 3,584 predictions that have been made, one hundred and thirty-four or 3.74 per cent., are considered to have entirely failed; fifty-three, or 1.48 per cent., were one-fourth verified; four hundred and eight, or 11.38 per cent., were one-half verified; one hundred and five, or 2.93 per cent., were three-fourths verified; 2,884 or 80.47 per cent., were fully verified, so far as can be ascertained from the tri-daily reports.

CAUTIONARY SIGNALS.

During November, 1882, one hundred and seventy-three cautionary signals were displayed. Of these, one hundred and fifty-two, or 87.84 per cent., were justified by winds of twenty-five miles per hour, at or within one hundred miles of the station. Of fourteen cautionary off-shore signals displayed, twelve, or 85.7 per cent., were fully justified; fourteen, or 100 per cent., were justified as to velocity; and twelve, or 85.7 per cent., were justified as to direction. Eight "northwest" signals were displayed, and were fully justified. One hundred and

ninety-five signals of all kinds were displayed, and one hundred and seventy-two, or 88.21 per cent., were justified. These do not include signals ordered at sixty-nine display stations, where the velocity only is estimated. Two signals were ordered late.

Eighty-five winds of twenty-five miles or more per hour were reported, for which no signals were ordered; many of these were high local winds, or strong sea-breezes.

NAVIGATION.

STAGE OF WATER IN RIVERS.

The highest and lowest stages of water observed at the Signal Service stations, during the month of November, 1882, are given in the table on the right side of chart iii., In the first column of this table, the heights of water which have been found dangerous to property are given.

In the Mississippi, the highest water occurred during the latter part of the month, except at Saint Louis, Missouri, where it was observed on the 1st and 2d. The Ohio was highest at Louisville, Kentucky, on the 7th and 8th; at Pittsburg, Pennsylvania, on the 16th; and at Cincinnati, Ohio, on the 22d. The Missouri was highest at Omaha, Nebraska, on the 1st; at Yankton, Dakota, on the 9th and 10th; and at Leavenworth, Kansas, on the 16th and 17th.

HIGH TIDES.

Cape Lookout, North Carolina, 21st. Highest tide in the sound ever known at this place. The water rose in the houses on the "Banks." The tides were also high on the 20th, 22d, 28th.

Hatteras, North Carolina, 22d. Very high tide in the sound.

Eastport, Maine, 22d, 23d, 23th.

Punta Rassa, Florida, 20th.

LOW TIDES.

New York City, 25th. The strong off-shore winds of the past few days caused unusually low tides in the lower bay and in Princes Bay, and about the shores of Staten Island. Thousands of acres of Princes Bay are entirely bare. Large quantities of clams have been gathered on the south beach; and the oyster beds in Prince's and Baritan Bays are uncovered. The Staten Island ferry-boats experienced much difficulty in making landings. Robbin's Reef, Oyster Island, and Old Tom Reef, in the upper bay were entirely dry.

Indianola, Texas, 21st. Very low tide.

ICE IN RIVERS AND HARBORS.

Penobscot river: Bangor, Maine, 18th, the dead-water above the mill-dam is frozen over; all mills in the vicinity are closed for the season.

Hudson river: Albany, New York, floating ice in the river on 28th, 29th, 30th.

Erie canal: Albany, New York, 28th, canal navigation suspended on account of ice.

Maumee river: Toledo, Ohio, 30th, floating ice in the river.

Red river: Saint Vincent, Minnesota, 11th, navigation suspended on account of ice. Moorhead, Minnesota, 10th, river frozen over; 11th, the steamer "Pluck," arrived on this date, being the last boat of the season. The steamer "Alsop" is beset in the ice twenty miles south of this city. Navigation is closed for the season.

Winnepeg, Manitoba, 13th: The Red river is frozen over at this place.

Missouri river: Fort Stevenson, Dakota, 28th, river entirely closed. Fort Bennett, Dakota, 9th, ice forming in river; 13th and 23d, floating ice in river. Omaha, Nebraska, 27th, 28th, floating ice in river. Leavenworth, Kansas, 30th, slush ice in river. Fort Hale, Dakota, 29th, river frozen over. Fort Buford, Dakota, 8th, river frozen; navigation closed for season. Fort Yates, Dakota, 8th, last boat of season passed to-day.

Mississippi river: Saint Paul, Minnesota, 19th, the steamer "Grand Pacific" left this port to-day for Saint Louis, being the last boat of the season. On the 24th, 25th, and 28th, there was floating ice in the river. On the 25th, the river was frozen along its banks from twenty to fifty feet from the shore. Bur-